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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/378,577	08/20/99	SHI W	60307-5001

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EXAMINER	
ZEMAN, R	
ART UNIT	**PAPER NUMBER**
1645	5

DATE MAILED: 04/12/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.	Applicant(s)
09/378,577	Shi et al.
Examiner	**Group Art Unit**
Robert A. Zeman	1645

☒ Responsive to communication(s) filed on *Aug 20, 1999* .

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-17* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-17* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *4*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Objections

Claims 13-16 are objected to because of the following informalities: The word "eukaryote" is misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 5,11 and 13-16 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the topical treatment using chimeric monoclonal antibodies, does not reasonably provide enablement for the treatment for the oral ingestion of tissue from transformed host. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Applicant describes the procedures for the use of *Arabidopsis thaliana* for the production of human/mouse chimeric monoclonal antibodies with specificity for *Streptococcus mutans*. Applicant fails to describe what procedures would be used when the plant species *Brassica*, or other edible plant, is used in lieu of *Arabidopsis.* Though the two species may be related they differ in many biochemical pathways. This point is further

reiterated by Applicant's use of *Arabidopsis* since "many of the genetic and biochemical tools have been developed for (it)" (see page 13, lines 12-13). If the two species were equivalent, the "tools" developed for *Arabidopsis* could be used with the species *Brassica.* Since they are not equivalent, and no direction is provided by Applicant for use of *Brassica*, the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claims 3-5, 9-11 and 13-16 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the production of IgG monoclonal antibodies by transformed plants, does not reasonably provide enablement for the production of IgM monoclonal antibodies by said plants. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Applicant describes procedures to humanize mouse IgG monoclonal antibodies. These procedures include the use IgG heavy chain and light chain probes as well as the gene for human IgG light and heavy chains (see pages 11-13). Applicant fails to describe the procedures to be used for the production of humanized IgM antibodies. IgM and IgG differ biochemically and structurally and would require different probes, expression vectors, etc within the scope of the disclosed procedures. Consequently, it would be impossible for a person skilled in the art to make and use the invention commensurate in scope with these claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 and 9 are rendered vague and indefinite by the use of the phrase "step of preparing". It is unclear what Applicant is referring to. Preparing the host? the monoclonal antibody? the chimeric antibody?. As written it is impossible to determine the metes and bounds of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lehner (U.S. Patent 5,352,446). Lehner discloses the use of a orally administered murine monoclonal antibody (see column 3 lines 46-52 and column 4, lines 4-13) for the treatment and prevention of dental caries in man (see column 2, line 31-32). Lehner further discloses that said monoclonal

antibody has a specificity for *Streptococcus mutans* and can be administered in gum, mouthwashes, or lozenges. Additionally, Lehner discloses that monoclonal antibodies against *S. mutans* antigens passively immunize and provide inhibition of the development of *S. mutans* on teeth for extended periods of time when applied topically (see column 2, lines 16-21).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-10, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (European Journal of Immunology 1994 Vol. 24 (1) pages 131-138) in view of Adair et al (U.S. Patent 5,877,293).

Ma et al. disclose methods for the production of chimeric monoclonal antibodies against *Staphylococcus mutans* in transgenic tobacco plants to be used in the treatment of dental caries in humans and other mammals (see page 131, second paragraph). The disclosed methods include: the cloning of heavy and light chain genes (see page 132); plant transformation and regeneration (see page 132); antibody chain detection (see pages 132-133); and measurement of chimeric antibodies and their binding capacities (see pages 133-134). Ma et al. differs from the claimed inventions in that both the heavy and light chains of the chimeric monoclonal antibodies are derived from murine antibodies. However, Adair et al. disclose methods for the production of chimeric antibodies where the light chains are derived from murine antibodies and the heavy chains are derived from human antibodies. Consequently, it would have been obvious to one of skill in the art at the time the invention was made to use the methods of Adair et al. to "humanize" the chimeric antibodies disclosed in the methods of Ma et al. This "humanizing" consists of replacing the murine heavy chain sequences of Ma et al. with the human heavy chain sequences of Adair et al. in the expression vectors of Ma et al. It should be noted that humanizing antibodies is a standard procedure used in most immunology laboratories. That, and coupled with the fact that Ma et al. suggests "incorporating other regions such as the complement binding region of human IgG" (see page 137, second paragraph) and Adair et al. state that chimeric monoclonal antibodies are less antigenic to humans and hence more effective therapeutically (see column 1 lines 52-65), one would have a high expectation of success in making the required antibodies and using them to treat or prevent dental caries..

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A. Zeman whose telephone number is (703) 308-7991. The examiner can be reached between the hours of 7:30 am and 4:00 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, Donna Wortman, Primary Examiner can be reached at (703) 308-1032 or the examiner's supervisor, Anthony Caputa, can be reached at (703)308-3995.

Robert A. Zeman

April 6, 2000

DONNA WORTMAN
PRIMARY EXAMINER